1. This communication is responsive to preliminary amendments of 5/27/05. The amendments have been entered. Claims 16-30 are now pending.

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 16-18, 21, and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Sauer et al. (German Patent Application DE 196 28 321 C1).

Regarding claims 16 and 30, Sauer teaches an optical communication system (Translation, page 4, lines 6-9 and fig. 1), comprising: a transmitter (1, fig. 1) for generating a phase-modulated (MOD 3, fig. 1) optical signal (Translation, page 4, lines 16-20); a receiver (E1, E2, fig. 1) for receiving the phase-modulated optical signal (Translation, page 5, 4th paragraph); an optical communication link (4, fig. 1) between the transmitter section (1, fig. 1) and the receiver section (E1, E2, fig. 1); the optical communication link comprising dispersion-compensation elements (D, 2', 5, 7, fig. 1) propagating the phase-modulated optical signal at substantially constant optical power (Translation, page 5, lines 1-14), and the receiver (E2, fig. 1) comprising a dispersive element (D, 7, fig. 1) having a prescribed dispersion (Translation, page 6, claim 5), the dispersive element receiving and converting the phase-modulated optical signal into a corresponding intensity-modulated optical signal (Translation, page 5, claim 1), and an optical intensity detector (E2, fig. 1) fed with the intensity-modulated optical signal (Translation, page 5, claim 1).

Regarding claim 17, Sauer teaches the transmitter comprises an optical carrier source (1, fig. 1) generating an optical carrier (Translation, page 4), and a phase modulator (MOD 3, fig. 1) driven by a modulating signal (S2, fig. 1) for imparting to the optical carrier a phase modulation (Translation, page 4).

Regarding claim 18, Sauer teaches the optical carrier source comprise a laser and the phase modulator comprises a $LiNbo_3$ modulator (Translation, page 4).

Regarding claim 21, Sauer teaches the dispersive element comprises one among an optical fiber section and a fiber Bragg grating (Translation, page 6, claim 6).

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claim 19, 22, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sauer et al. (German Patent Application DE 196 28 321 C1) in view of Gill et al. (US Patent Application Publication No: 2004/0208647 A1).

Regarding claim 19, Sauer differs from the claimed invention in that Sauer does not specifically teach the modulating signal is coded in a return-to-zero format. Gill teaches an optical transmission system (100, 106, 130 fig. 1) to transmit phase modulated optical signals (page 2, paragraph 0027 and 103, fig. 1), wherein the modulating signal is coded in a return-to-zero signal format (see abstract). As it is taught by Gill, it would have been obvious to a person of ordinary skill in that art at the time of invention to incorporate a return-to-zero signal format

for coding the subcarrier signals in the transmission system of Sauer to provide a high bit rate data transmission system.

Regarding claims 22 and 26, Sauer teaches the optical communication link comprises at least one optical communication link section (4, fig. 1) comprising a dispersion-compensated optical fiber span (See Translation page 6, claim 5 and D, 5, fig. 1). As to an optical amplifier, it is well known to place optical amplifiers along the transmission links to boost the signal strength. For example, Gill teaches the use of an optical amplifier (115, fig. 1) along the transmission link (106, fig. 1) to amplify the transmitted signals (page 2, paragraph 0027). As it is taught by Gill, it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate an optical amplifier along the transmission link in the optical transmission system of Sauer to boost the signal strength and to increase the transmission reach. As to claim 26, the use of erbium doped optical amplifiers, or semiconductor optical amplifiers, or Raman optical amplifiers in the optical transmission systems are well known.

6. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sauer et al. (German Patent Application DE 196 28 321 C1) in view of Miyamoto et al. (US Patent No: 6,865,348 B2).

Regarding claim 20, Sauer teaches the receiver comprises an optical power splitter (6, fig. 1), a first and second dispersive elements (D, 5, 7, fig. 1) with mutually opposite dispersion fed by the power splitter (note that dispersive elements 5 and 7 can be chosen to have mutually opposite dispersion), a first and second optical intensity detectors (E1, E2, fig. 1) respectively fed by the first and second dispersive elements (optical intensity detectors E1 and E2, respectively

fed by the first and second dispersive elements 5 and 7, as it is shown in fig. 1) and generating a first and a second electrical signals (See Translation, page 5). Sauer differs from the claimed invention in that Sauer does not disclose a subtractor for subtracting the first electrical signal from the second electrical signal. Miyamoto discloses an optical transmission system that is comprised of an optical transmitter (1, fig. 7 and 101, fig. 26), an optical link (P_0, fig. 7 and 103, fig. 26) with dispersion compensation elements (DCFs, fig. 7), and an optical receiver (9, fig. 1 and 102, fig. 26), wherein the receiver (102, figs. 26, 30) includes a subtractor (185, fig. 30) for subtracting a first and second electrical signal detected (col. 27, lines 23-28, 45-50). It would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate optical detection circuits and a subtractor, such as the ones of Miyamoto, for the optical to electrical receiving circuits of Sauer to detect and regenerate the original signal in the transmission system (Miyamoto, col. 7, lines 55-59).

7. Claim 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sauer et al. (German Patent Application DE 196 28 321 C1) in view of Gill et al. (US Patent Application Publication No: 2004/0208647 A1) and in further view of Franco et al. (US Patent No: 7,010,231 B1).

Regarding claims 23-25, Sauer teaches the use of special fibers or fiber Bragg gratings as dispersive elements (See Translation, page 6, claims 4, 5, 6). The modified optical transmission system of Sauer and Gill differs from the claimed invention in that Sauer and Gill do not specifically disclose step-index optical fiber and non-zero dispersion shifted optical fiber as dispersion compensating elements. Franco teaches an optical transmission system (38, fig. 7)

with chromatic dispersion compensation (Compensation Units, fig. 7), wherein step-index optical fiber and non-zero dispersion shifted optical fibers are used (col. 12, lines 47-65, col. 14, lines 10-18). As it is taught by Franco, it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate step-index optical fiber and/or non-zero dispersion shifted optical fiber, as a dispersion compensating elements for the dispersion compensating elements of Sauer, to allow a maximum overall dispersion compensation when reaching a longer distance (Franco, col. 12, lines 52-55, col. 14, lines 12-14).

8. Claims 16 and 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gill et al. (US Patent Application Publication No: 2004/0208647 A1) in view of Sauer et al. (German Patent Application DE 196 28 321 C1).

Regarding claim 16, Gill teaches an optical communication system (fig. 1), comprising: a transmitter (Transmitter, fig. 1) for generating a phase-modulated optical signal (page 1, paragraph 0004); a receiver (Balanced Detector, fig. 1) for receiving the phase-modulated optical signal (page 1, paragraph 0004); an optical communication link (106, fig. 1) between the transmitter section and the receiver section (page 2, paragraph 0027); the optical communication link comprising dispersion-compensation elements (108, 109, 111, fig. 1) propagating the phase-modulated optical signal at substantially constant optical power (note that the phase modulated optical signals can propagate at substantially constant optical power), and optical intensity detectors (130, 142, 144, fig. 1) fed with the modulated optical signal (page 2, paragraph 0027). Gill differs from the claimed invention in that Gill does not disclose the receiver comprises of a dispersive element having a prescribed dispersion, which converts the phase-modulated optical

signal into a corresponding intensity-modulated optical signal. Sauer discloses an optical transmission system (fig. 1) for transmitting a phase modulated optical signal (MOD 3, fig. 1), wherein a dispersive element (D, 7, fig. 1) receives and converts the phase-modulated optical signal into a corresponding intensity modulated optical signal (See Translation, page 5, claim 1). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate an optical receiver with a dispersive element that transforms a phase modulated signal into an intensity modulated signal, such as the one of Sauer, for the optical receiver of Gill to receive and retrieve the phase modulated and intensity modulated data signals.

Regarding claim 27, Gill teaches at least two transmitter units (optical MSK transmitters, fig. 1), each one generating a respective phase modulated optical signal (page 2, paragraph 0027, lines 4-11), the phase modulated optical signals generated by different transmitter units being differentiated by wavelength and a wavelength multiplexer (WDM, fig. 1) receiving the phase modulated optical signal generated by different transmitter units and generating wavelength division multiplexed optical signal (page 2, paragraph 0027, lines 9-12) and the receiver (Receiver, fig. 1) comprises a wavelength demultiplexer (WDM 125, fig. 1) receiving and demultiplexing the wavelength multiplexed optical signal (page 2, paragraph 0027, lines 16-20).

Regarding claim 28, Gill teaches the dispersive element (111, 109, 108, fig. 1) is placed upstream the wavelength demultiplexer (WDM 125, fig. 1) in the light propagation direction (page 2, paragraph 0027, lines 13-18).

9. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gill et al. (US Patent Application Publication No: 2004/0208647 A1) in view of Sauer et al. (German Patent Application DE 196 28 321 C1) and in further view of Thomas (US Patent No: 6,968,132 B1).

Regarding claim 29, Gill teaches the receiver (120, fig. 1) comprises at least two receiver units (the receiver units that are connected to the output of WDM 125, such as receiver 130). The modified optical transmission system of Gill and Sauer differs from the claimed invention in that Gill and Sauer do not disclose a respective dispersive element in each receiver unit. Thomas discloses an optical WDM transmission system (500, fig. 5), wherein dispersion compensation units (DMs, fig. 5) are provided for respective receiving units (Rcvr 1, Rcvr2, fig. 5). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate respective dispersive elements, such as the ones of Thomas, for each of the optical receiving units 130 in the optical receiving system 120 of Gill modified by Sauer to respectively compensate for the accumulated dispersion of different channels.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. R. Sedighian whose telephone number is (571) 272-3034. The examiner can normally be reached on 9 to 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/M. R. Sedighian/
Primary Examiner, Art Unit 2613